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IN THE APPLICATION

OF

ISAIAH FREEMAN

FOR A

SUSPENDED HUB CAP

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ARLINGTON, VA 22215
(703) 486-1000

SUSPENDED HUB CAP

CROSS-REFERENCE TO RELATED APPLICATION

This application claims the benefit of U.S. Provisional Patent Application Serial No. 60/472,461, filed May 22, 2003.

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

The present invention generally relates to automobile accessories. More specifically, the present invention is drawn to freely rotating hubcaps, commonly referred to as "spinner" hubcaps.

2. DESCRIPTION OF RELATED ART

The use of spinner hubcaps is well known and is well represented in the related art. For example, U.S Patents numbered 3,158,946 (Upchurch), 3,219,391 (Hettinger), 3,722,958 (Marshall) and 5,290,094 (Gragg) disclose wheel covers mounted for rotation independently of wheel rotation. The wheel covers include no balancing means to insure proper rotation.

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U.S. Patent numbered 2,997,344 (Whiteman) shows an inner hub that is rotated independently of an outer hub. The outer hub, however, rotates in the conventional manner.

U.S. Patent numbered 4,388,771 (LaLonde) is drawn to a decorative display device for a hubcap. The device includes a disc sealed within the hubcap. The disc is weighted on one side only so that it always returns to the same position when the wheel stops rotating. The hubcap rotates in a conventional manner.

There is a need for a decorative, freely rotating hubcap that can be securely mounted onto an existing wheel or hub with little modification and is properly balanced so as to insure proper rotation without wobble. The present invention fulfils this need.

None of the above inventions and patents, taken either singly or in combination, is seen to disclose a free spinning hubcap as will subsequently be described and claimed in the instant invention.

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SUMMARY OF THE INVENTION

The present invention is directed to a spinner hubcap. More particularly, the spinner hubcap can be installed on existing standard hubs by modifying each of the wheel studs on the standard hub to include a tapped hole that can receive a respective mounting bolt from the spinner hubcap. The spinner hubcap includes a bearing connecting it to the wheel, as well as balancing weights to ensure that it easily rotates when the wheel is in motion and that it comes to rest eventually after the wheel comes to rest.

Accordingly, the invention incorporates a spinner hubcap that is mounted onto a wheel of an automobile with a bearing and mounting bolts, which mounting bolts fit into modified wheel studs. The wheel studs are each tapped with a hole for receiving a respective mounting bolt. Balancing weights are employed to ensure that the hubcap quickly and easily rotates without wobble when the wheel rotates and, also, comes to rest eventually after the wheel comes to rest.

The invention provides improved elements and arrangements thereof in an apparatus for the purposes described which are inexpensive, dependable and fully effective in accomplishing their intended purposes.

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These and other objects of the present invention will become readily apparent upon further review of the following specification and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an environmental, perspective view of a spinner hubcap according to the present invention.

Fig. 2 is an exploded view of the spinner hubcap showing the bearing and additional support plates according to the present invention.

Fig. 2A is a partial, exploded view showing the lock washer shaft arrangement according to the present invention.

Fig. 3 is a perspective view of a wheel having a spinner hubcap bearing mounted thereon according to the present invention.

Fig. 4 is a perspective of the spinner hubcap assembly, including the bearing and support plates, as seen from the rear side of the hubcap according to the present invention.

Similar reference characters denote corresponding features consistently throughout the attached drawings.

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DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Fig. 1 shows a perspective view of a vehicle wheel and tire **12** with the inventive spinning hubcap installed. The decorative exterior hubcap shell **20** is mounted onto an outer plate **24** of a bearing assembly by means of bolts **22**.

Details of the spinning hubcap assembly are best shown in Figs. 2 and 2A. The hubcap shell **20** is selected to be slightly undersized in comparison with the size of the wheel **90**, i.e., by approximately one inch. For example, a fourteen-inch diameter hubcap would be used on a fifteen-inch diameter wheel.

The wheel **90** is normally mounted on wheel studs **26** which extend from the hub, and the wheel is secured by fastening lug nuts onto the studs **26**. For use with the present invention, the wheel studs **26** are modified by tapping threaded holes axially into the ends of the wheel studs **26** to a depth sufficient to receive mounting bolts that secure the bearing assembly to the wheel.

The bearing assembly includes a disk-shaped base plate **40** which is mounted to the wheel by bolts **42** which extend through holes **44** and are threaded into the bores defined in wheel studs **26**. Shaft **50** has a smooth-faced central portion with an inner end **52** and an outer end **54** of smaller diameter than the central

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portion. The inner end **52** and outer end **54** are separated from the central portion by shoulders. The inner end **52** and outer end **54** of shaft **50** also have internally threaded bores defined therein. The inner end **52** is externally threaded to comprise a stud. The external surface of outer end **54** is smooth. Shaft **50** is secured to base plate **40** by threading stud **52** into a hole defined in the center of base plate **40**, and by securing the shaft **50** with bolt **46**, which bolt is fastened into the internal bore defined in the stud **52**. Pins are provided on ends **52** and **54** to further stabilize shaft **50** and prevent independent rotation.

Disk-shaped outer plate **24** has a smooth bore **78** defined through its center. Outer plate **24** is secured to the outer end **54** of shaft **50** by sliding outer plate **24** onto the outer end **54** of shaft **50**, and by securing the plate to the shaft by bolt **76**, which is threaded into the internally threaded bore defined in outer end **54** of shaft **50**. Bolt **76** does not tighten into shaft **50** so firmly that outer plate **24** is clamped to shaft **50**, but merely retains outer plate **24** on the smooth outer end **54** of shaft **50** due to its flanged head, or by a washer **79** placed under the head of the bolt **76**, so that outer plate **24** rotates with bearing **30**. Outer plate **24** has a cylindrical well defined therein that receives bearing **30**. The bearing **30** is secured in

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the well by bearing retainer plate **60**, which also has a cylindrical well **66** defined therein for receiving the opposite side of bearing **30**. Retainer plate **60** is secured to outer plate **24** by bolts **62** which extend through holes **64** defined in the periphery of retainer plate **60** and are secured in threaded holes **74** provided in the outer plate **24** for that purpose. Bearing **30** does not rotate within the wells defined in outer plate **24** and retainer plate **60**, but freely rotates about the central portion of shaft **50**.

Bearing **30** is preferably a ball bearing that permits outer plate **24** to rotate freely about shaft **50** in either a clockwise or counterclockwise direction for a full 360 degrees. Hubcap shell **20** is fastened to outer plate **24** by bolts **22**, which bolts engage threaded holes **72** provided in outer plate **24** so that hubcap **20** rotates with outer plate **24** about shaft **50**.

Fig. 3 shows the bearing assembly mounted on wheel **90** with hubcap shell **20** removed. Fig. 4 shows the rear side of hubcap shell **20** (the side normally facing wheel **90**) with the bearing assembly attached for purposes of illustration. The drawing shows outer plate **24** adjacent hubcap shell **20**, base plate **40** parallel to outer plate **24**, and retainer plate **60** disposed between the outer plate 24 and base plate **40**. The drawing also shows the head of bolt **46**, which secures shaft **50** to base plate

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40. Also seen are the ends of bolts 42, which would otherwise extend into the bores defined in wheel studs 26.

In practice, the spinner hubcap is balanced to provide for smooth rotation in much the same fashion as the wheels 90 are balanced after mounting new tires 12 on the wheels 90, i.e., by adding weights to the periphery of the hubcap shell 20. One such weight 92 is shown in Fig. 4, it being understood that a plurality of such weights may be added if required. The weights 92 may be secured to hubcap shell 20 by rivets or other appropriate fasteners. Balancing the hubcap spinner reduces friction and wear on the bearing 30.

The dimensions of the plates 40, 60, 24 and bearing 30 are selected so that they adequately fit in the corresponding opening in the wheel 90. Thus, the hubcap 20 will be capable of rotating near the rim of the wheel.

Although materials for the various parts of the spinner hubcap are preferably high strength metal, e.g., plate or cast steel, any material having suitable strength is contemplated. Alternatively, the plates 24, 40 and 60 and hubcap shell 20 may be made from a high strength aluminum alloy for lighter weight. Further, various components, for example, the hubcap shell 20, can be made from a hard plastic or composite material.

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When the hubcap is adequately balanced, the hubcap **20** will rotate after sufficient rotation of the wheel **90** due to the effects of wind drag and inertia, thereby giving a visual effect of a slowly rotating wheel. Then, when the wheel **90** stops rotating, as when the vehicle comes to a stop, the hubcap **20** continues to rotate for a short period of time by inertia, thereby giving the visual effect of a wheel that continues to rotate.

It is to be understood that the present invention is not limited to the sole embodiments described above, but encompasses any and all embodiments within the scope of the following claims.

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